



# PUMA VT series

## PUMA VT450 / 750 / 900 / 1100

High Performance Vertical Turning Center



Doosan Machine Tools

*Optimal Solutions for the Future*

# **PUMA VT series**

## **PUMA VT450 / 750 / 900 / 1100**

The vertical turning center is designed for long term accuracy, heavy duty cutting and to minimize floor space. Its powerful spindle drives, meehanite casting and integral box guide way provide unsurpassed rigidity.



**New standard for unsurpassed high productivity,  
high speed and high precision**



## Basic Mechanism

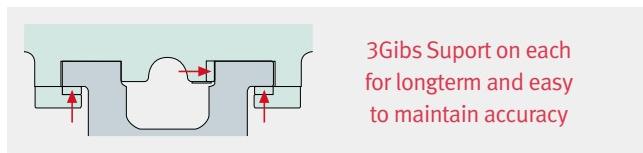


### Robust Bed Construction

In order to assure heavy duty machining and optimized chip flow, the machine base body is designed and streamlined. Its small foot print help you systemizing your manufacturing plan plot in your factory.

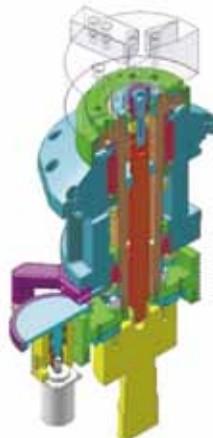
### Robust Column Construction

The wide hardened and ground box ways reduce vibration promoting better tool life and surface finishes. The box ways are turcite coated which allows for 787 ipm rapid traverse rates. The Balanced Counter Weight located inside the column, neutralizes the gravity effect on the Vertical slide. It will also conserve electricity and prevent Turret Drop while in Emergency stop or Power failure. All axis Slides are Induction Hardened and Ground Hrc 55 Hardness. Long-term Accuracies are very basic requirements on Doosan Infracore products. 3 adjustable Gibs on each Axis slide are provided to maintain original accuracy.



### High Performance Spindle & Turret

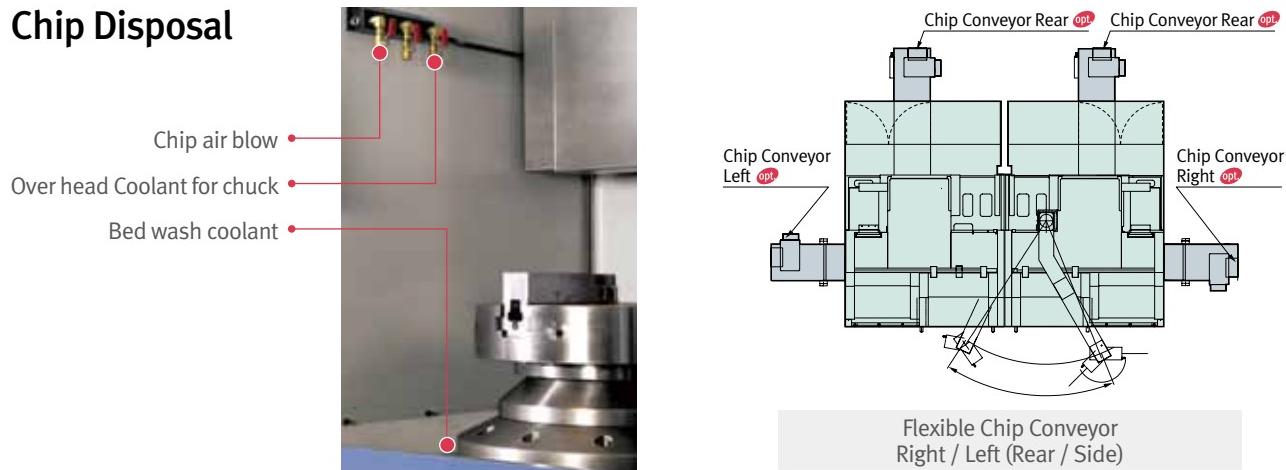
The spindle is supported by a double row of tapered roller bearings in the Top and Bottom of the spindle while angular thrust bearings provide tremendous radial load capability. The Cartridge Spindle is axial symmetric construction, which provides very stable accuracy all day-long even when the spindle is heated up by continuous operation.



V12 Turret is ground finish for Zero accuracy. Turret has large Three piece curvic couplings. of clamping force so high accuracy and heavy-duty cutting can be achieved. The 12 station turret holds ID or OD tools.



## Chip Disposal



## Safety Cover



## Easy Operation



The swing arm on the Main Operation panel is a userfriendly feature to minimize the distance from Part to operator's Panel during setup. Narrow Vertical panel is space saving design. The handy Sub Operation Panel beside Door for each spindle has Cycle start, Feed hold, Emergency stop, Door Open/close switches.



## Accessories



Gear box **opt.**  
PUMA VT900 / VT1100 **std.**



Auto door **opt.**  
Pneumatic cylinder



Manual tool setter **opt.**  
Removable type, Renishaw

# PUMA VT450

VT450 / VT450M / VT450-2SP / VT450M-2SP



Max. spindle speed

**2500 r/min**

Motor (30 min)

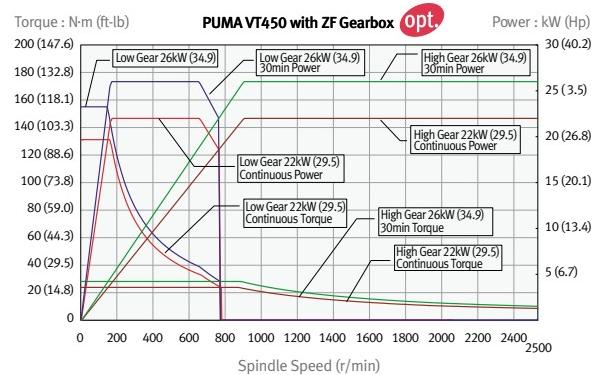
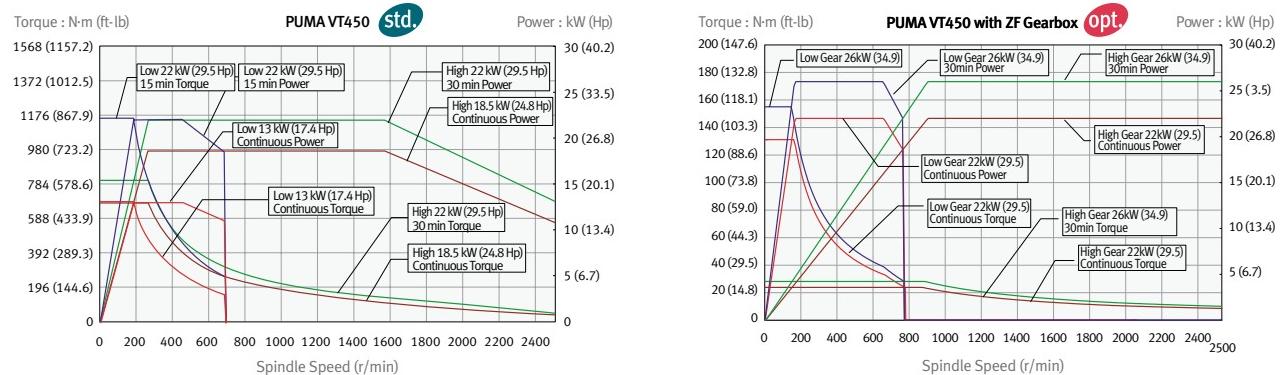
**22 kW (29.5 Hp)**

## Main Specification std.

Travels (X / Z axis)	mm (inch)	240 / 450 (9.4 / 17.7)
Chuck size	mm (inch)	305 (12.0)
Max. Spindle speed	r/min	2500
Spindle motor (Cont. / 15min.)	kW (Hp)	18.5 / 22 (24.8 / 29.5)
Rapid Traverse (X / Z axis)	m/min (ipm)	20 / 20 (787.4 / 787.4)
Turret index time	s	1.6 (PUMA VT450)
No. of tool station	stations	12
Std. M/C dimension (L x W x H)	mm (inch)	1445 x 2491 x 3009 (56.9 x 98.1 x 118.5)*
Machine weight	kg (lb)	6200 kg (13668.5 lb)*

\* : PUMA VT450 / VT450M

## Main Spindle Power-torque Diagram



# PUMA VT750

VT750 / VT750M / VT750-2SP / VT750M-2SP



Max. spindle speed

**2000 r/min**

Motor(30 min)

**30 kW (40.2 Hp)**

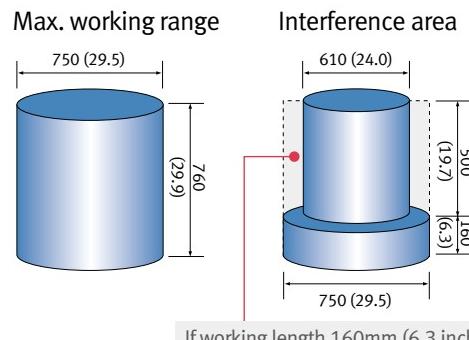
## Main Specification std.

Travels (X / Z axis)	mm (inch)	385 / 760 (15.2 / 29.9)
Chuck size	mm (inch)	381 (15.0)
Max. Spindle speed	r/min	2000
Spindle motor (Cont. / 30min.)	kW (Hp)	22 / 30 (29.5 / 40.2)
Rapid Traverse (X / Z axis)	m/min (ipm)	20 / 20 (787.4)
Turret index time	s	1.8 (PUMA VT750)
No. of tool station	stations	12
Std. M/C dimension (L x W x H)	mm (inch)	1850 x 2785 x 3450* (72.8 x 109.6 x 135.8)
Machine weight	kg (lb)	9700 (21384.5)*

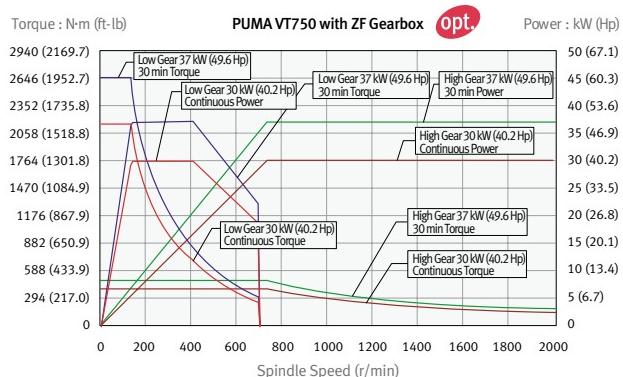
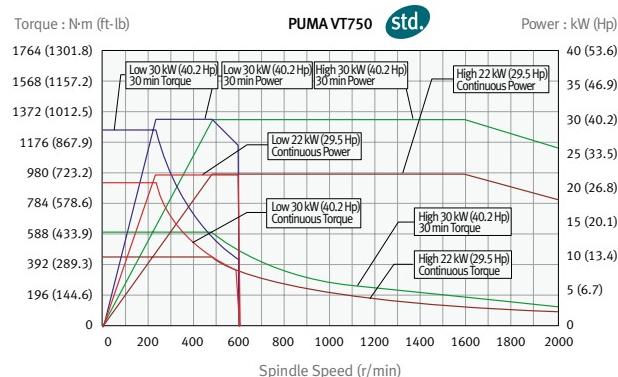
\* : PUMA VT750 / VT750M

## Working Range

unit : mm (inch)



## Main Spindle Power-torque Diagram



# PUMA VT900

VT900 / VT900M / VT900-2SP / VT900M-2SP



Max. spindle speed

**1800 r/min**

Motor(30 min)

**45 kW (60.3 Hp)**

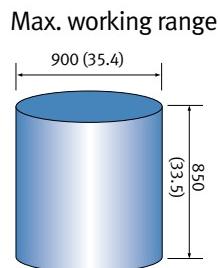
## Main Specification std.

Travels (X / Z axis)	mm (inch)	470 / 850 (18.5 / 33.5)
Chuck size	mm (inch)	610 (24.0)
Max. Spindle speed	r/min	1800
Spindle motor (Cont. / 15min.)	kW (Hp)	37 / 45
Rapid Traverse (X / Z axis)	m/min (ipm)	20 / 20 (787.4 / 787.4)
Turret index time	s	2.0 (PUMA VT900)
No. of tool station	stations	12
Std. M/C dimension (LxWxH)	mm (inch)	2130 x 3050 x 3621* (83.9 x 120.1 x 142.6)
Machine weight	kg (lb)	12500 (2755.7)*

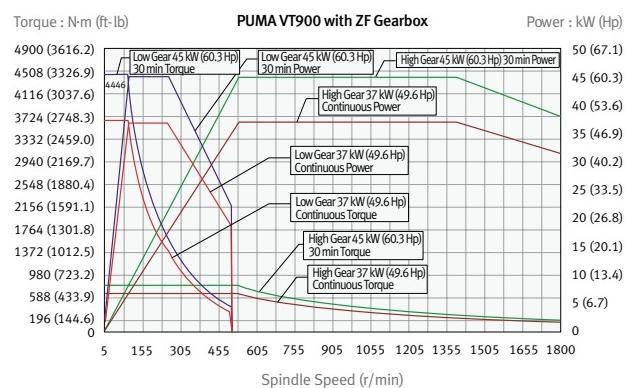
\* : PUMA VT900 / VT900M

## Working Range

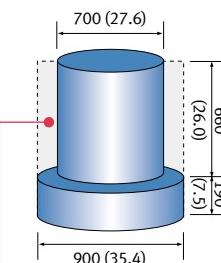
unit : mm (inch)



## Main Spindle Power-torque Diagram



## Interference area



If working length 190mm (7.5 inch)  
excess, interference area

# PUMA VT1100

## VT1100 / VT1100M



Max. spindle speed

**850 r/min**

Motor(30 min)

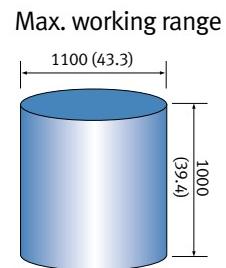
**60 kW (80.5 Hp)**

### Main Specification std.

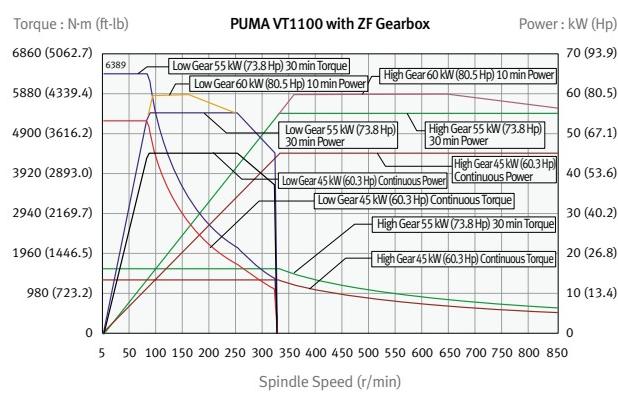
Travels (X / Z axis)	mm (inch)	580 / 1000 (22.8 / 39.4)
Chuck size	mm (inch)	800 (31.5)
Max. Spindle speed	r/min	850
Spindle motor (Cont./30min./10min.)	kW (Hp)	45 / 55 / 60 (60.3 / 73.8 / 80.5)
Rapid Traverse (X / Z axis)	m/min (ipm)	20 / 20 (787.4 / 787.4)
Turret index time	s	2.2
No. of tool station	stations	12
Std. M/C dimension (L x W x H)	mm (inch)	2850 x 3305 x 4012 (112.2 x 130.1 x 158.0)
Machine weight	kg (lb)	22000 (48501.0)

### Working Range

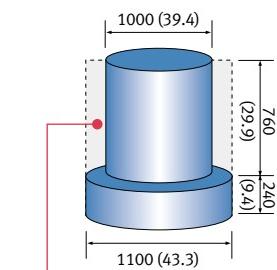
unit : mm (inch)



### Main Spindle Power-torque Diagram



### Interference area

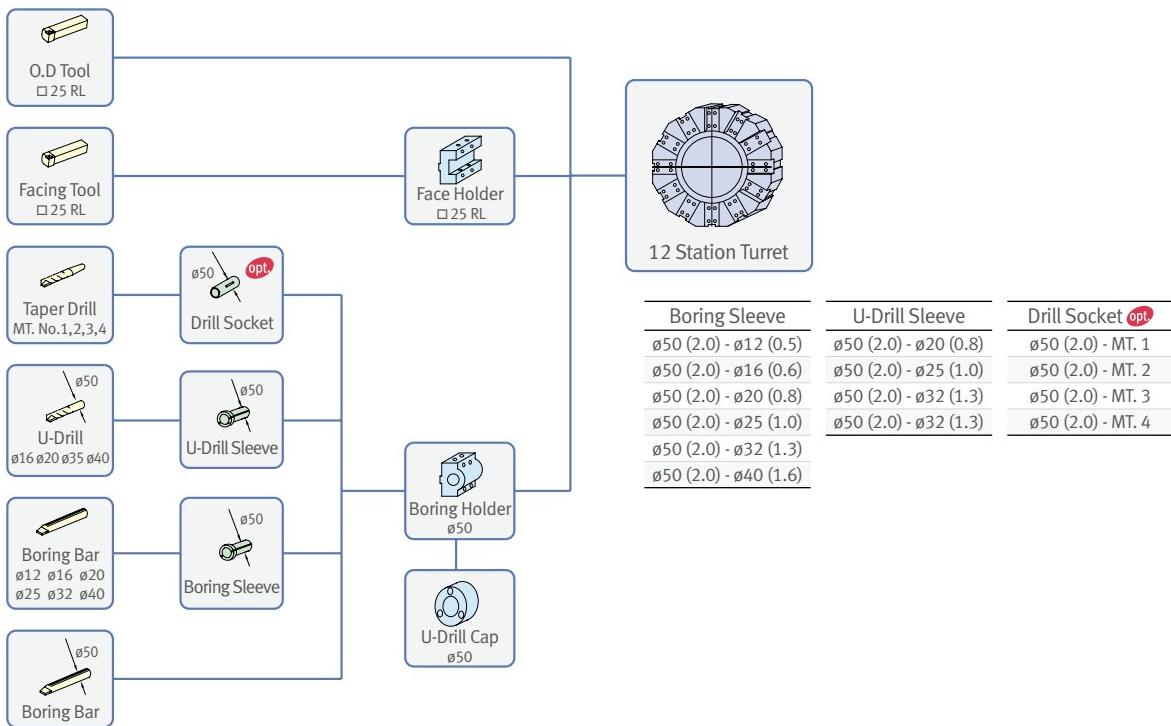


If working length 240mm (9.4 inch)  
excess, interference area

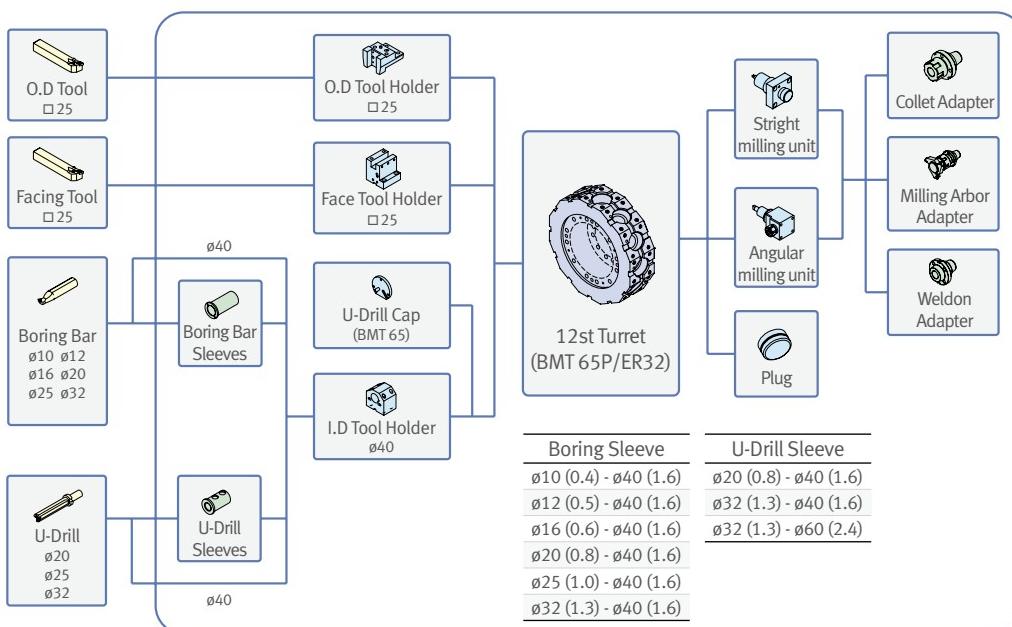
# Tooling System

## PUMA VT450 / VT450-2SP

Unit: mm (inch)



## PUMA VT450M / VT450M-2SP

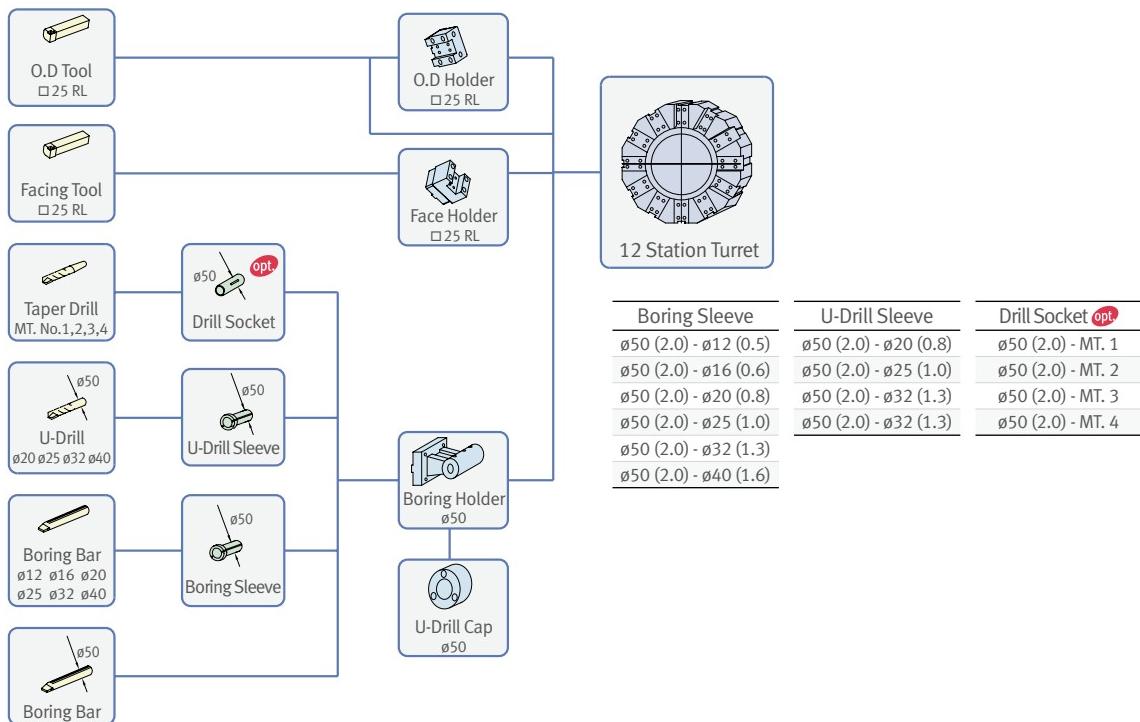


Note) Above tooling system is our recommendation.

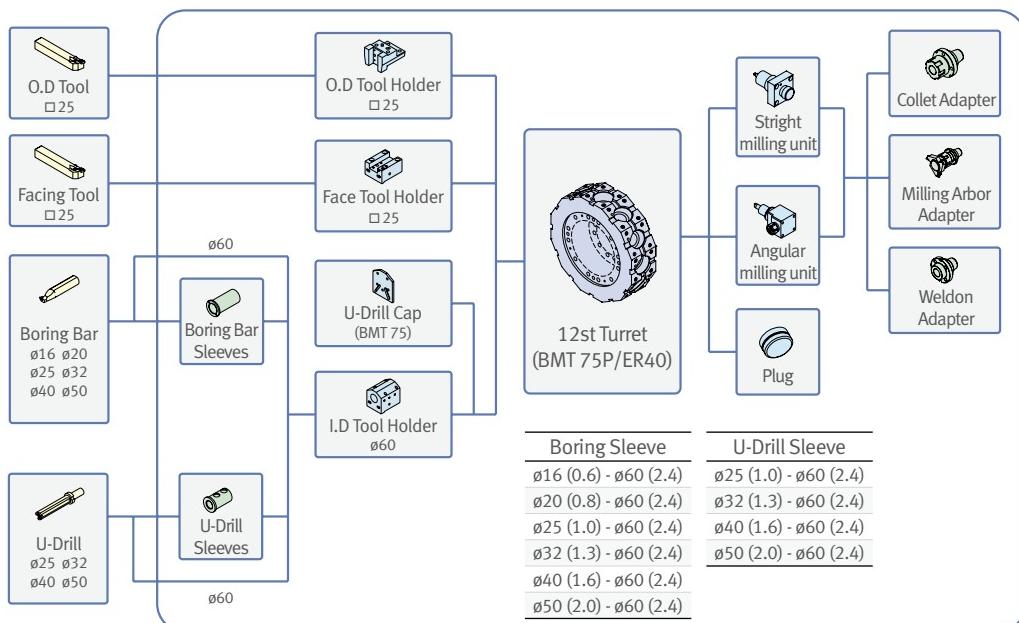
Depending on export condition, the standard tooling packed with the machine can be different.

Unit: mm (inch)

## PUMA VT750 / VT750-2SP



## PUMA VT750M / VT750M-2SP



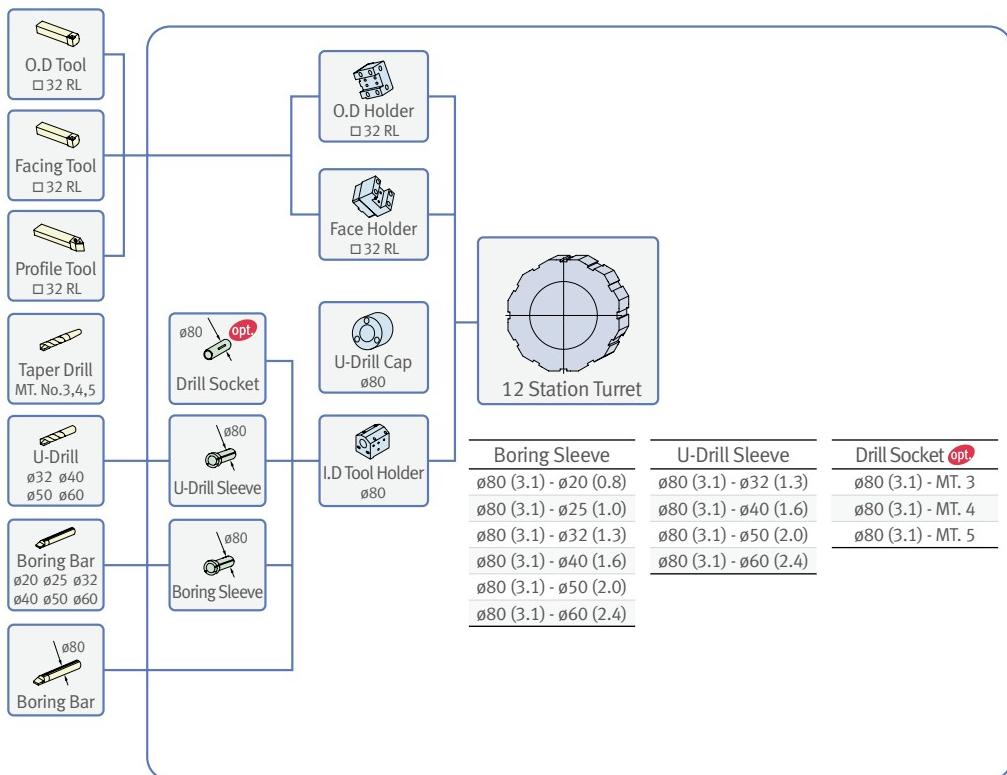
Note) Above tooling system is our recommendation.

Depending on export condition, the standard tooling packed with the machine can be different.

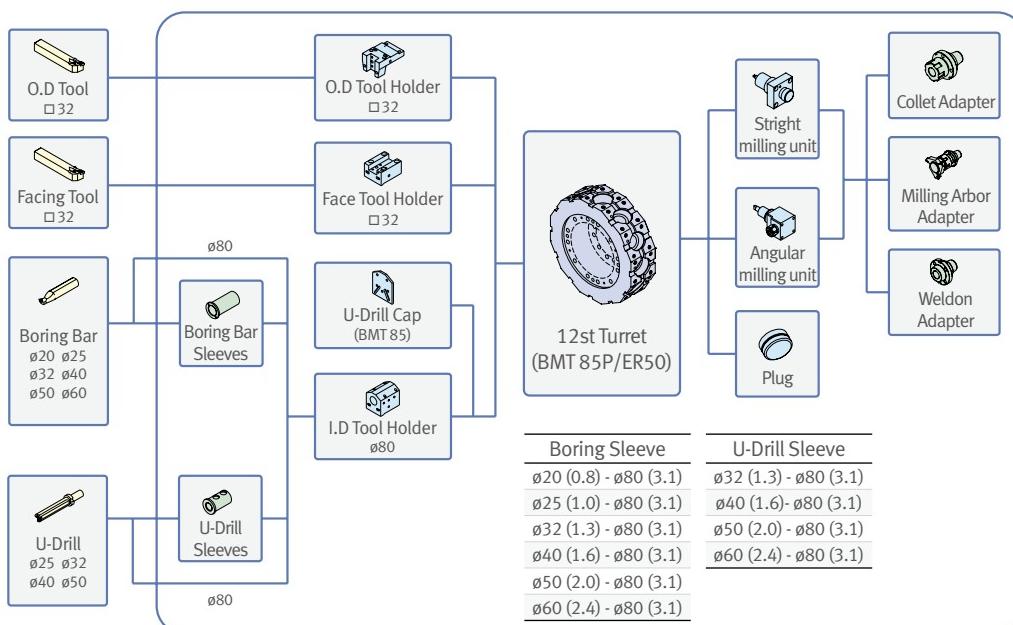
# Tooling System

Unit: mm (inch)

## PUMA VT900 / VT900-2SP



## PUMA VT900M / VT900M-2SP

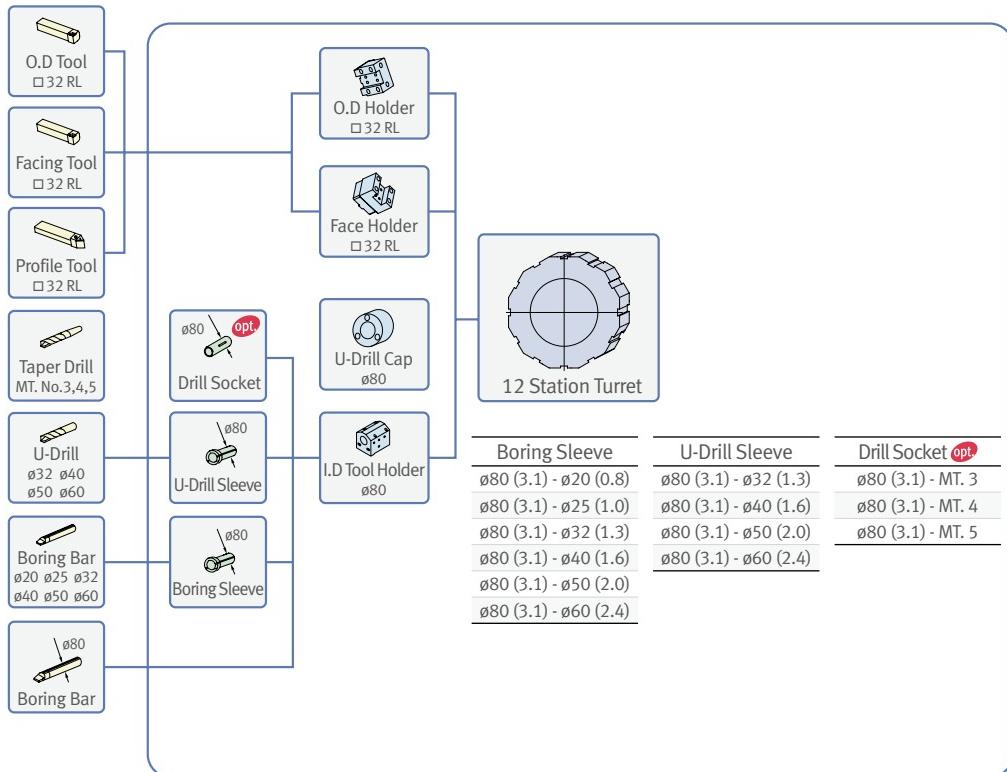


Note) Above tooling system is our recommendation.

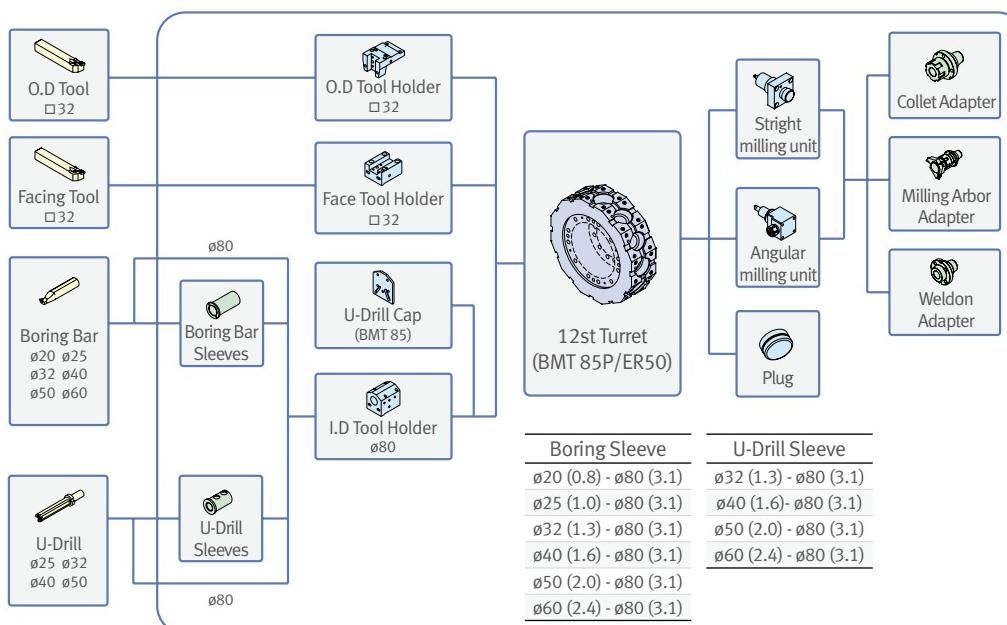
Depending on export condition, the standard tooling packed with the machine can be different.

Unit: mm (inch)

## PUMA VT1100



## PUMA VT1100M

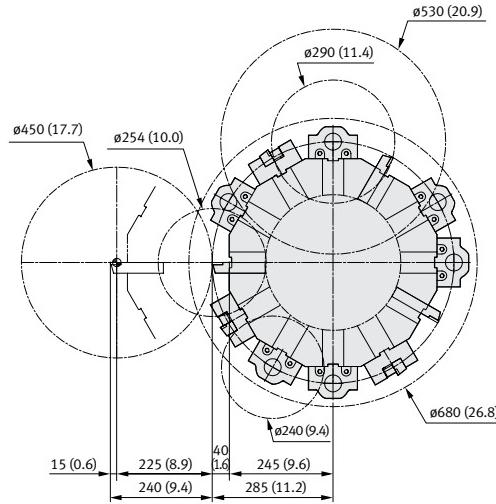


Note) Above tooling system is our recommendation.

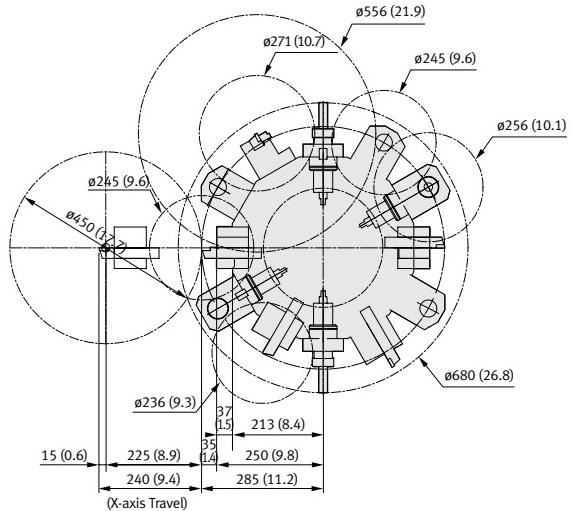
Depending on export condition, the standard tooling packed with the machine can be different.

# Tool Interference Diagram

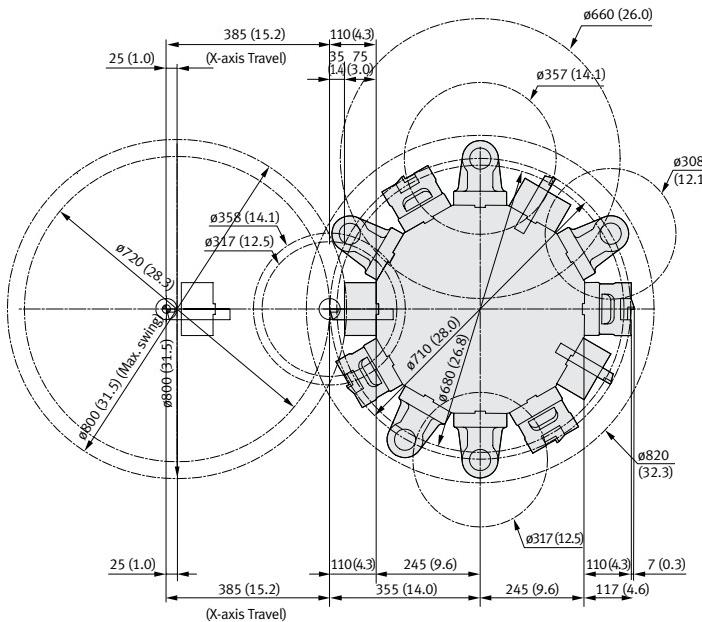
PUMA VT450 / VT450-2SP



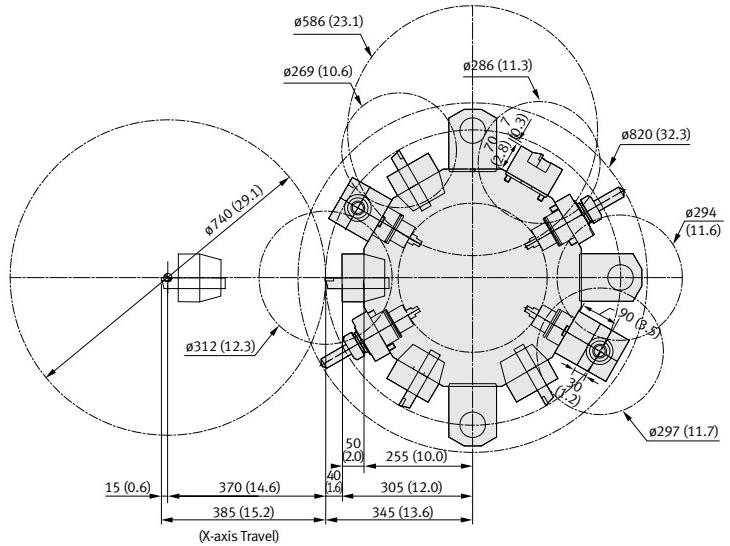
PUMA VT450M / VT450M-2SP



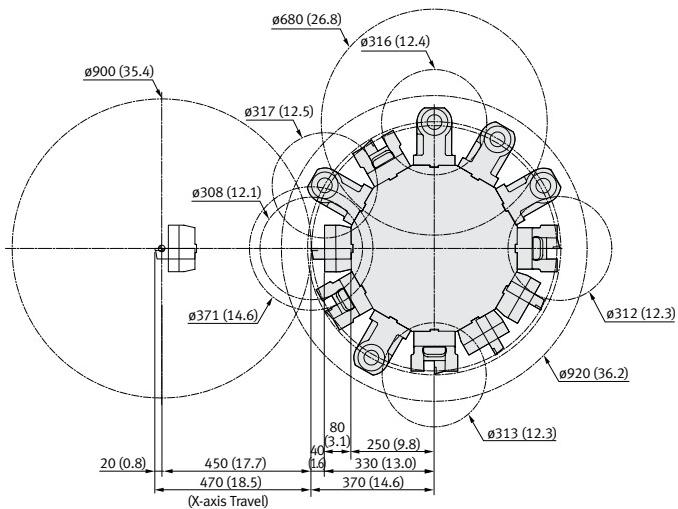
PUMA VT750 / VT750-2SP



PUMA VT750M / VT750M-2SP

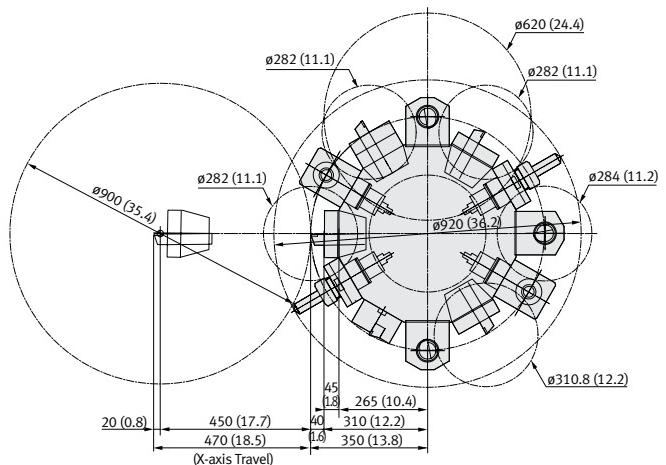


## PUMA VT900 / VT900-2SP

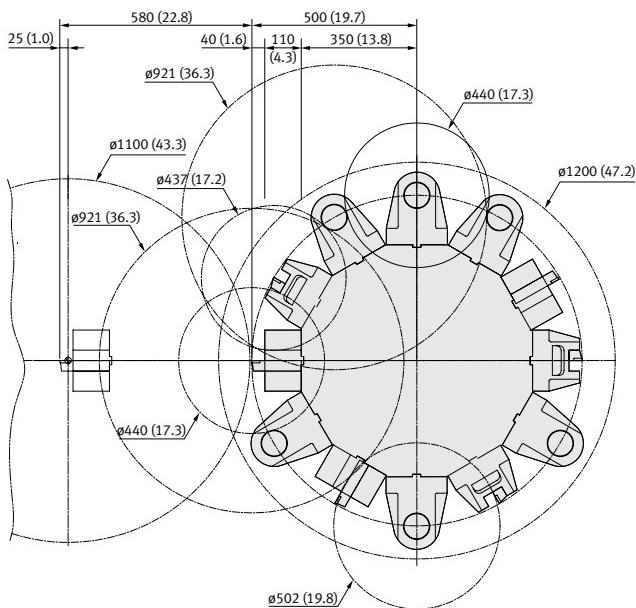


#### PUMA VT900M / VT900M-2SP

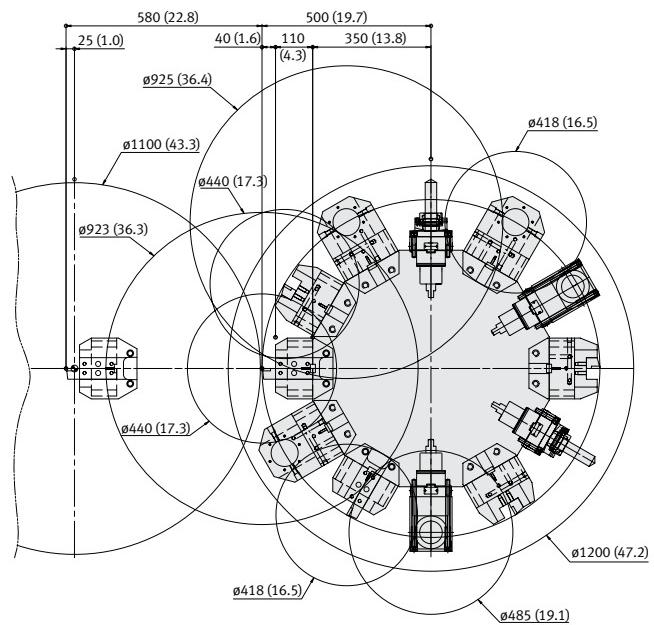
Unit: mm (inch)



PUMA VT1100

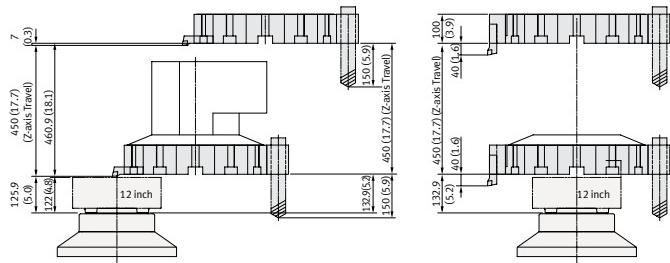


PUMA VT1100M

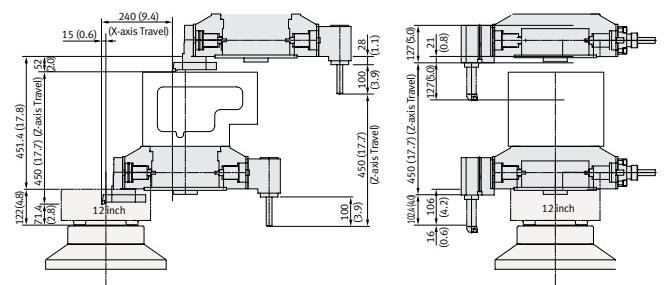


# Working Range

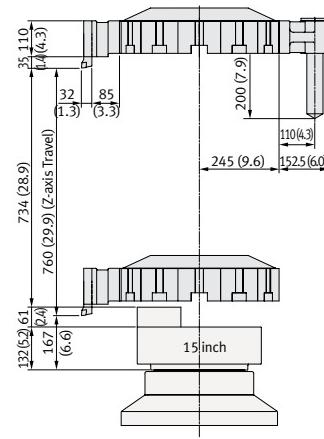
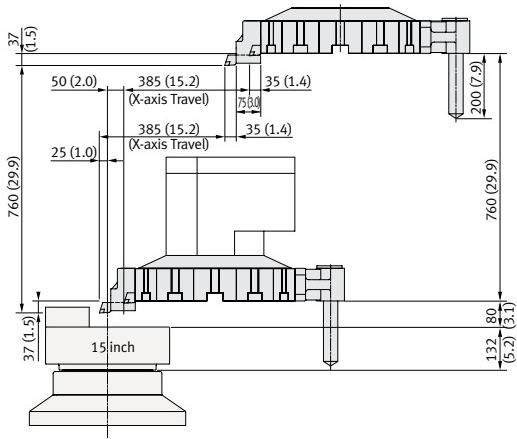
**PUMA VT450 / VT450-2SP**



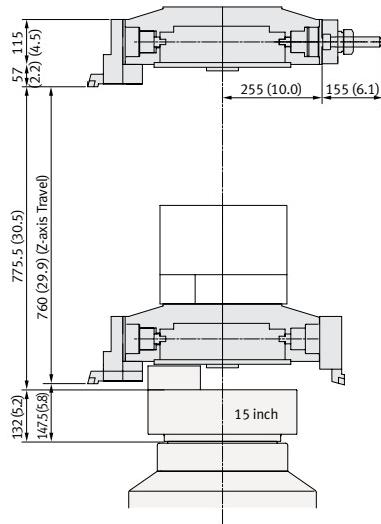
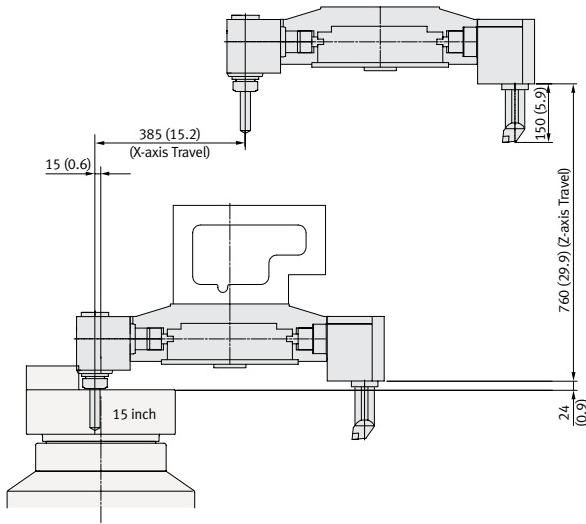
**PUMA VT450M / VT450M-2SP**



**PUMA VT750 / VT750-2SP**

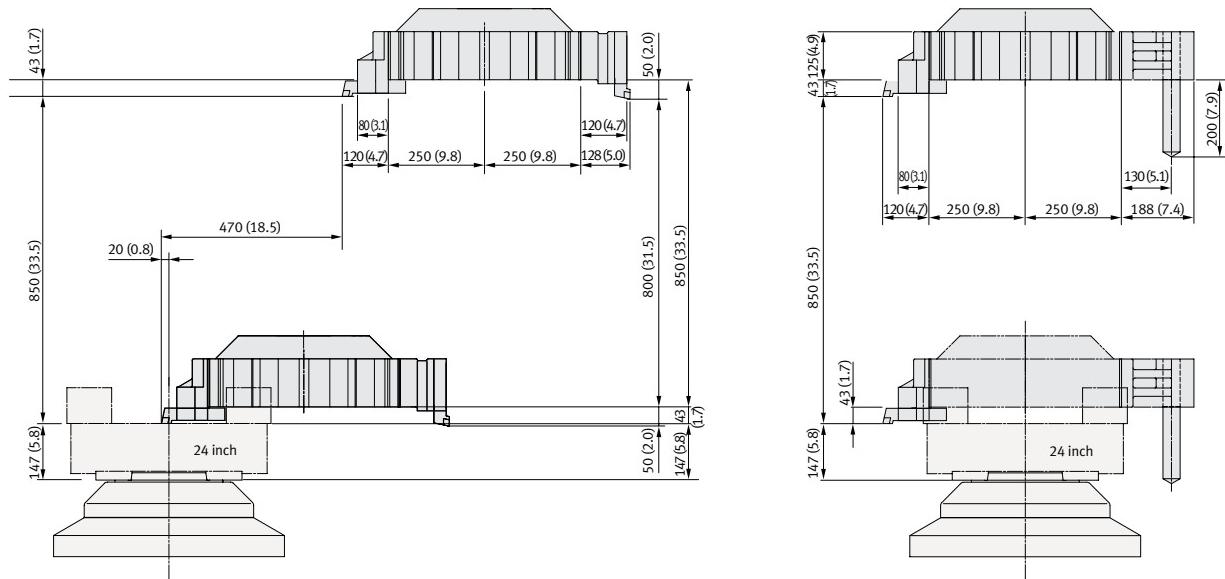


**PUMA VT750M / VT750M-2SP**

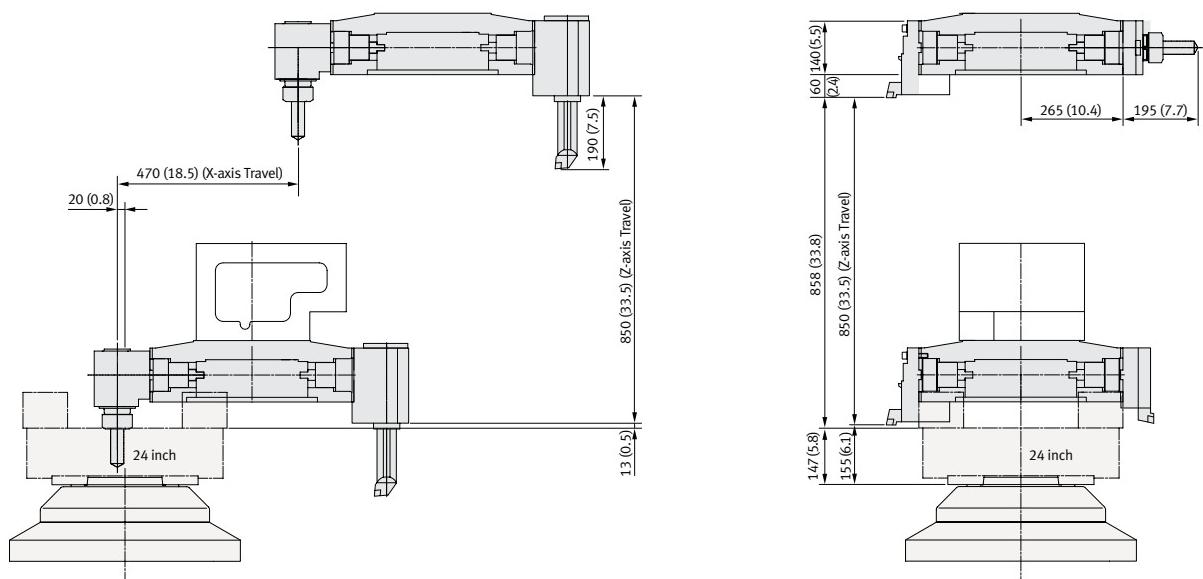


## PUMA VT900 / VT900-2SP

Unit: mm (inch)



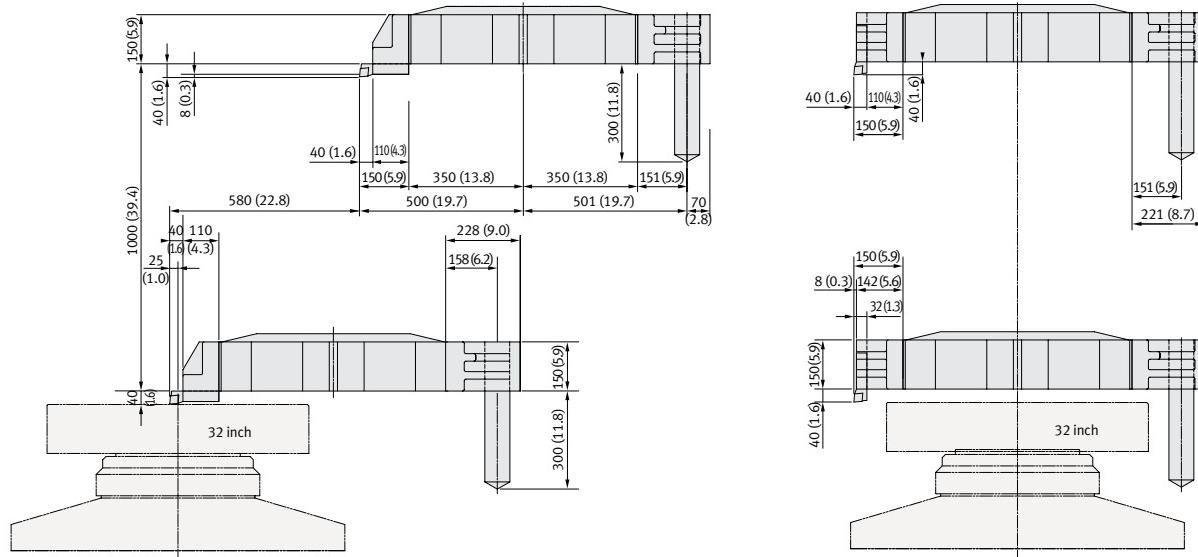
## PUMA VT900M / VT900M-2SP



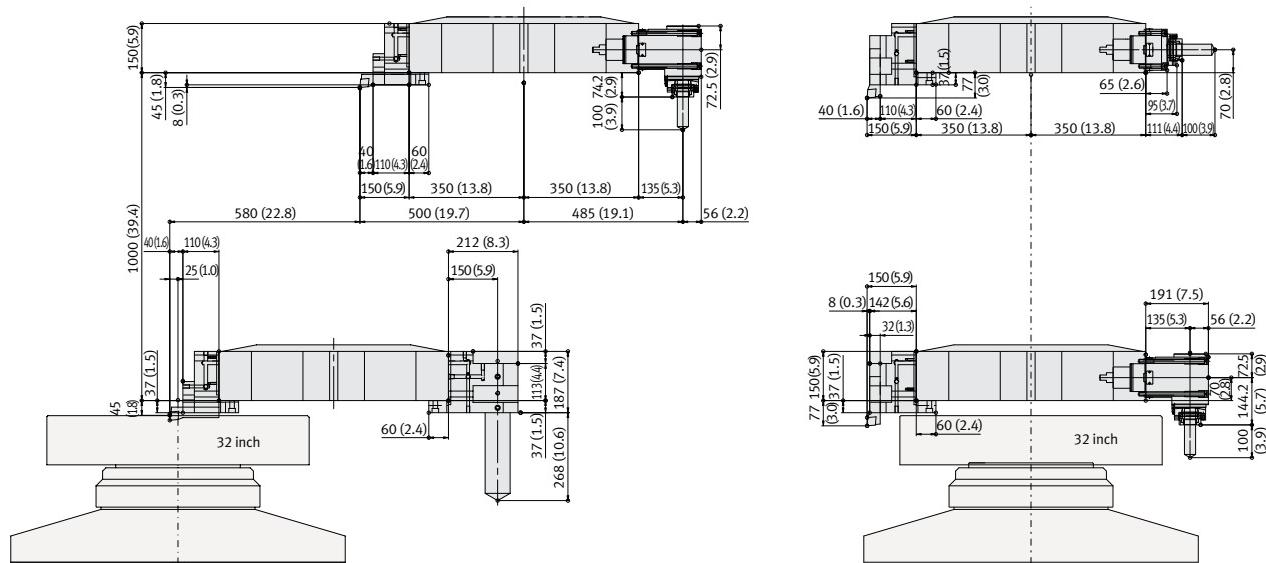
# Working Range

PUMA VT1100

Unit: mm (inch)



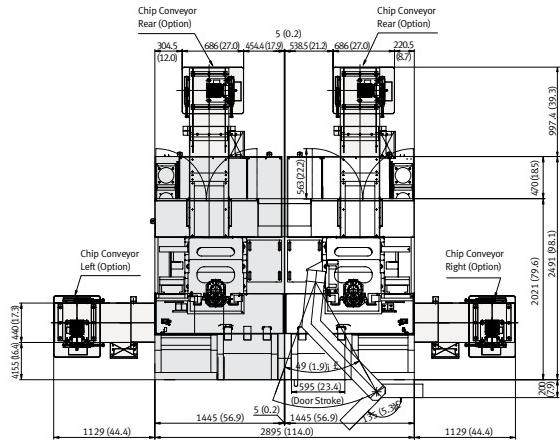
PUMA VT1100M



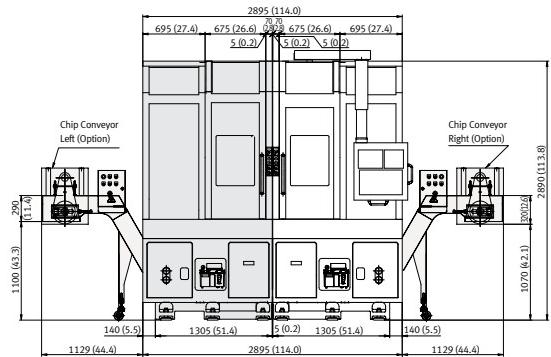
# External Dimensions

## PUMA VT450 / VT450M / PUMA VT450-2SP / VT450M-2SP

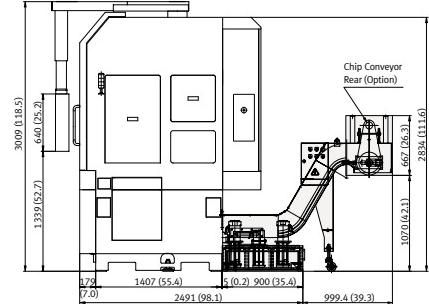
## Top View



## Front View

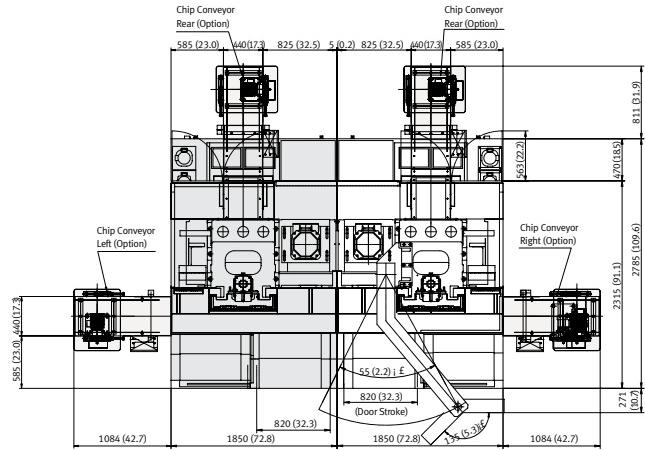


## Side View

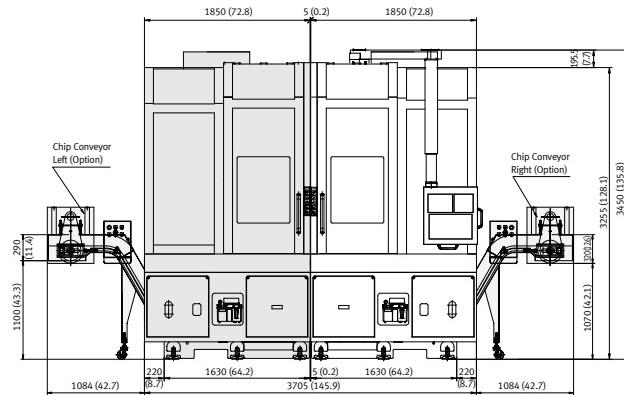


## PUMA VT750 / VT750M PUMA VT750-2SP / VT750M-2SP

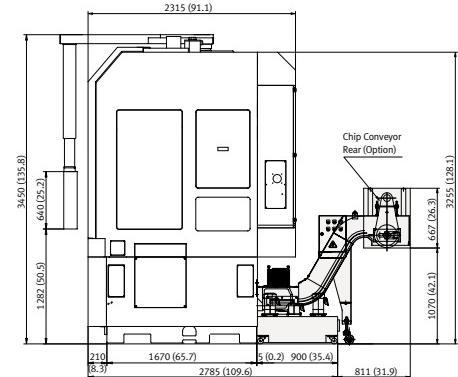
## Top View



## Front View



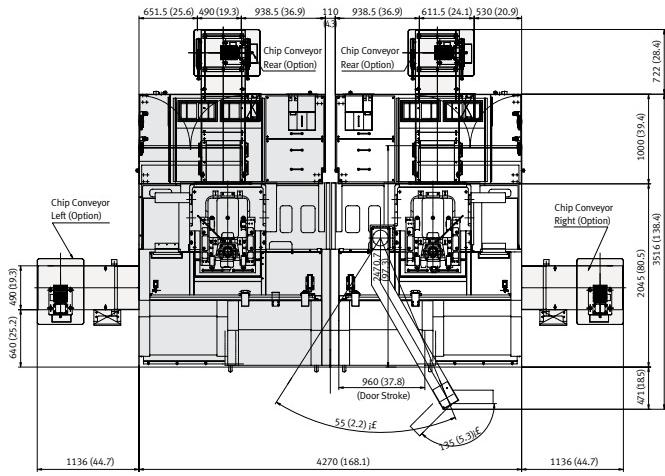
## Side View



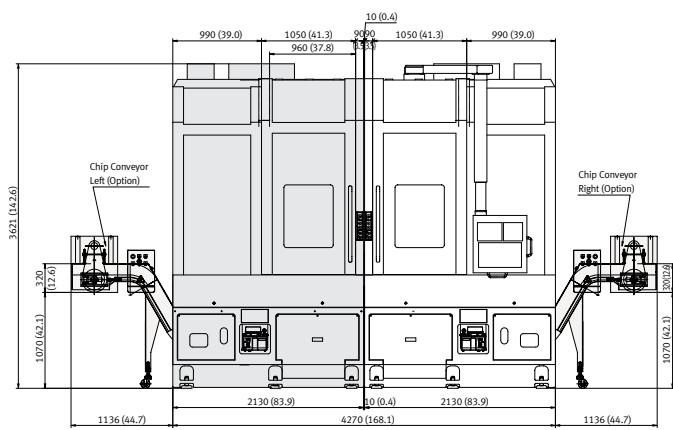
# External Dimensions

## PUMA VT900 / VT900M PUMA VT900-2SP / VT900M-2SP

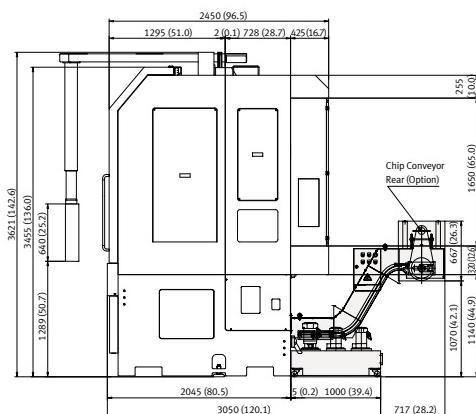
## Top View



## Front View



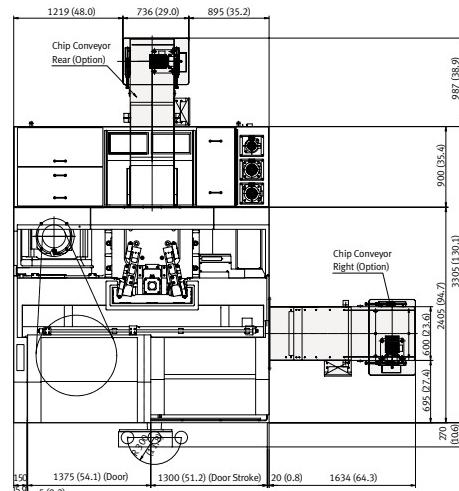
## Side View



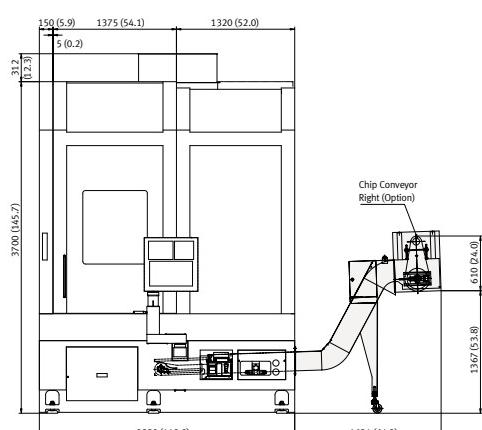
Unit: mm (inch)

## PUMA VT1100 / VT1100M

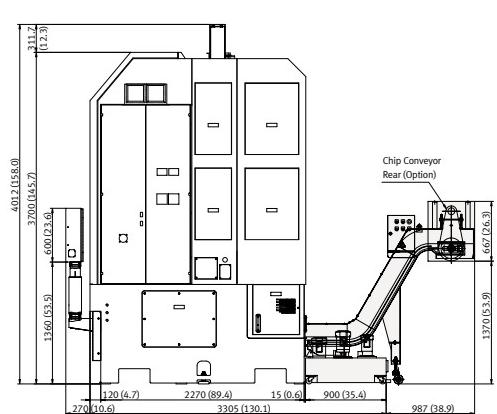
## Top View



## Front View



## Side View



# Machine Specifications

Description		Unit	PUMA VT450	PUMA VT450-2SP	PUMA VT450M	PUMA VT450M-2SP	PUMA VT750	PUMA VT750-2SP	PUMA VT750M	PUMA VT750M-2SP			
Capacity	Swing over bed	mm (inch)	580 (22.8)		800 (31.5)								
	Swing over saddle	mm (inch)	450 (17.7)		610 (24.0)								
	Recom. turning diameter	mm (inch)	380 (15.0)		450 (17.7)								
	Max. turning diameter	mm (inch)	450 (17.7)		750 (29.5)								
	Max. turning length	mm (inch)	450 (17.7)		760 (29.9)								
	Chuck size	mm (inch)	305 (12)		380 (15)								
Travels	X-axis	mm (inch)	240 (9.4)		385 (15.2)								
	Z-axis	mm (inch)	450 (17.7)		760 (29.9)								
Feedrates	Rapid traverse rate	X-axis	m/min	20 (787.4)									
		Z-axis	m/min	20 (787.4)									
Main Spindle	Spindle speed	r/min	2500		2000								
	Spindle nose	ASA	A2#8		A2#11								
	Spindle bearing diameter (Front)	mm (inch)	120 (4.7)		160 (6.3)								
	Spindle through hole	mm (inch)	62 (2.4)		77 (3.0)								
	Main spindle indexing angle (C-axis)	deg	-	360 (in 0.001)		-	360 (in 0.001)						
Turret	No. of tool stations	st	12										
	OD tool size	mm (inch)	25 (1.0)										
	Max. boring bar size	mm (inch)	ø50 (ø2.0)		ø40 (ø1.6)		ø50 (ø2.0)		ø60 (ø2.4)				
	Turret Indexing time (1 station swivel)	s	1.6		1.2		1.8		1.4				
Motor	Main spindle motor	kW (Hp)	22 (29.5) [15min.] {26 (34.9) [30min.]}		30 (40.2) [30min.] {37 (49.6) [30min.]}								
	Servo motor	X/Z-axis	kW (Hp)	3.0 / 4.0 (4.0 / 5.4)									
	Rotary tool spindle motor	kW (Hp)	-	4.5 (6.0)		-	7.0 (9.4)						
Power source	Electric power supply (rated capacity)	kVA	50 {55}	95 {105}	55 {60}	100 {110}	55 {65}	105 {125}	60 {70}	115 {140}			
Machine Size	Height	mm (inch)	3009 (118.5)		3450 (135.8)								
	Length	mm (inch)	1445 (56.9)	2895 (114.0)	1445 (56.9)	2895 (114.0)	1850 (72.8)	3705 (145.9)	1850 (72.8)	3705 (145.9)			
	Width	mm (inch)	2491 (98.1)		2785 (109.6)								
	Weight	kg (lb)	6200 (13668.5)	12400 (27336.9)	6200 (13668.5)	12400 (27336.9)	9700 (21384.5)	19400 (42769.0)	9700 (21384.5)	19400 (42769.0)			
Controller	Fanuc i series	Fanuc 31i	Fanuc i series	Fanuc 31i	Fanuc i series	Fanuc 31i	Fanuc i series	Fanuc 31i	Fanuc i series	Fanuc 31i			

{ } : Option

## Standard Feature

- Coolant flushing for bed
- Coolant flushing for chuck
- Coolant supply equipment
- Full enclosure chip and coolant shield
- Hydraulic chuck & actuating cylinder
- Hand tool kit, including small hand tool for operationst
- Hydraulic power unit
- Leveling jack screw & plates
- Lubrication equipment
- Soft jaws
- Standard tooling kit (tool holders & boring sleeve & U-Drill sleeve)
- Work light

## Optional Feature

- Air blast for chuck jaw cleaning
- Automatic door with safety device
- Chip bucket
- Coolant gun
- Drill socket
- Dual chucking pressure
- Hardened & ground jaws
- High pressure coolant
- Manual tool presetter (Removable type)
- Oil skimmer (Belt type)
- Proximity switch for chuck clamp detection
- Signal tower (yellow, red, green)
- Special chucks
- Straddle tool preparation (Piping & Solenoid valve, Exclude straddle tool)

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# Machine Specifications

Description		Unit	PUMA VT900	PUMA VT900-2SP	PUMA VT900M	PUMA VT900M-2SP	PUMA VT1100	PUMA VT1100M	
Capacity	Swing over bed	mm (inch)	1000 (39.4)		1270 (50.0)				
	Swing over saddle	mm (inch)	700 (27.6)		1000 (39.4)				
	Recom. turning diameter	mm (inch)	610 (24.0)		800 (31.5)				
	Max. turning diameter	mm (inch)	900 (35.4)		1100 (43.3)				
	Max. turning length	mm (inch)	850 (33.5)		1000 (39.4)				
Travels	Chuck size	mm (inch)	609 (24)		800 (32)				
	X-axis	mm (inch)	470 (18.5)		580 (22.8)				
	Z-axis	mm (inch)	850 (33.5)		1000 (39.4)				
Feedrates	Rapid traverse rate	X-axis	m/min	20 (787.4)					
		Z-axis	m/min	20 (787.4)					
Main Spindle	Spindle speed	r/min	1800		850				
	Spindle nose	ASA	ISO 702-1 A2#15		ISO 702-4-No15				
	Spindle bearing diameter (Front)	mm (inch)	200 (7.9)						
	Spindle through hole	mm (inch)	107 (4.2)		100 (3.9)				
	Main spindle indexing angle (C-axis)	deg	-		360 (in 0.001)		-		
Turret	No. of tool stations	st	12						
	OD tool size	mm (inch)	32 (1.3)						
	Max. boring bar size	mm (inch)	ø80 (ø3.1)						
	Turret Indexing time (1 station swivel)	s	2.0		1.6		2.2		
Motor	Main spindle motor	kW (Hp)	45 (60.3) [30min.]		60 (80.5) [10min.]				
	Servo motor X/Z-axis	kW (Hp)	4.0 / 4.0 (5.4 / 5.4)		4.0 / 7.0 (5.4 / 9.4)				
	Rotary tool spindle motor	kW (Hp)	-		7.0 (9.4)		-		
Power source	Electric power supply (rated capacity)	kVA	75	145	80	155	90	100	
Machine Size	Height	mm (inch)	3621 (142.6)		4012 (158.0)				
	Length	mm (inch)	2130 (83.9)	4270 (168.1)	2130 (83.9)	4270 (168.1)	2850 (112.2)		
	Width	mm (inch)	3050 (120.1)		3305 (130.1)				
	Weight	kg (lb)	12500 (27557.4)	25000 (55114.8)	12500 (27557.4)	25000 (55114.8)	22000 (48501.0)		
Controller			Fanuc 32i	Fanuc 31i	Fanuc 32i	Fanuc 31i	Fanuc 32i		

## Standard Feature

- Coolant flushing for bed
- Coolant flushing for chuck
- Coolant supply equipment
- Full enclosure chip and coolant shield
- Hydraulic chuck & actuating cylinder
- Hand tool kit, including small hand tool for operationst
- Hydraulic power unit
- Leveling jack screw & plates
- Lubrication equipment
- Soft jaws
- Standard tooling kit (tool holders & boring sleeve & U-Drill sleeve)
- Work light

## Optional Feature

- Air blast for chuck jaw cleaning
- Automatic door with safety device
- Chip bucket
- Coolant gun
- Drill socket
- Dual chucking pressure
- Hardened & ground jaws
- High pressure coolant
- Manual tool presetter (Removable type)
- Oil skimmer (Belt type)
- Chuck clamp confirmation
- Signal tower (yellow, red, green)
- Special chucks
- Straddle tool preparation (Piping & Solenoid valve, Exclude straddle tool)

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# NC Unit Specifications

	Item	Spec.	Doosan Fanuc i series	Fanuc 32i	Fanuc 31i
Controls	Controlled axes	X, Z, C (l)	X, Z, C (l)	X, Z, X2, Z2	X1, Z1, X2, Z2
	Simultaneously controlled axes	Std. 2 axes	4 axes (l)	3 axes (l)	4 axes
Axis Functions	Backlash compensation	0~±9999 pulses	○	○	○
	Cs contouring control		○(l)	○(l)	-
	Follow-up / Chamfering on/off		○	○	○
	HRV2 control		○	○	○
	Least input increment	0.001mm / 0.0001"	○	○	○
	Stored stroke check1	Overtravel control	○	○	○
Operation	Automatic operation(memory) / Buffer register		○	○	○
	Handle incremental feed	X1, X10, X100	○	○	○
	Search function	Sequence NO. / Program NO.	○	○	○
Interpolation	1st, reference position return	Manual, G28	○	○	○
	2nd reference position return	G30	○	○	○
	Reference position return check	G27	○	○	○
	Circular interpolation	G02	○	○	○
	Continuous thread cutting		○	○	○
	Dwell	G04	○	○	○
	Linear interpolation	G01	○	○	○
	Multiple threading / Thread cutting retract		○	○	○
	Polar coordinate interpolation		○(l)	○(l)	-
	Thread cutting / Synchronous cutting		○	○	○
Feed Functions	Feed per minute / Feed per revolution		○	○	○
	Feedrate override	0 - 200% (10% unit)	○	○	○
	Jog feed override	0 - 2000 mm/min	○	○	○
	Rapid traverse override	F0/ 25 / 100%	○	○	○
Auxiliary & Spindle Functions	Tangential speed constant control		○	○	○
	1st Spindle orientation		○	○	○
	Constant surface speed control		○	○	○
	M-function	M3 digit	○	○	○
	Multi-spindle control		○(l)	○(l)	○
	Rigid tapping		○	○	○
	Spindle speed override	0~150%	○	○	○
	Absolute / Incremental programming		○	○	○
	Canned cycle for drilling / turning		○	○	○
	Custom macro		○	○	○
Programming Functions	Decimal point programming / pocket calculator type decimal point programming		○	○	○
	Direct drawing dimension programming		○	○	○
	Manual guide i	Conversational programming	○	○	○
	Maximum program dimension	±9 digits	○	○	○
	Multi repetitive canned cycle	G70~G76	○(l)	○	○
	Optional block skip(without hardware)	Total 9 (Only NC function)	-	○	○
	Sequence number		N5	N8	N8
	Programmable data input	G10	○	○	○
	Sub program call	Nested holds	4	10	10
	Tape format for FANUC series 10/11		○	○	-
	Tape format for FANUC series 15		-	-	○
	Work coordinate system selection	G52~G59	○	○	○
Tool Functions	Auto tool offset		○	○	○
	Tool monitoring system		-	Opt.	Opt.
	Direct input of tool offset value measured B		○	○	○
	Tool geometry / wear compensation	Geometry & wear data	○	○	○
	Tool life management		○	○	○
	Tool nose radius compensation	G40~G42	○	○	○
	T-code function	T2+2 digits	○	○	○
	Tool offset pairs		64	64	32
Editing Op. Functions	Tool offset value counter input		-	○	○
	Background editing		○	○	○
	Expanded part program editing	Copy, Move, Change of NC program	○	○	○
	No. of Registered programs		400ea	500ea	500ea
	Part program editing / Program protect		○	○	○
Setting & Display	Part program storage length <sup>*1</sup>		1280m	640m	640m
	Display of spindle speed and T-code at all screen		○	○	○
	Help function	Alarm&Operation display	○	○	○
	Self diagnostic function		○	○	○
	Servo setting screen / Spindle setting screen		○	○	○
Data Input & Output	Tool path graphic display		○	Opt. (l)	○
	I/O interface	RS-232C	○	○	○
	Memory card input and output		○	○	○
Other Functions	Reader puncher control	CH1 interface	○	○	○
	Ethernet function	Embedded ethernet function	○	○	○
	MDI / DISPLAY unit		10.4" color TFT LCD	10.4" color TFT LCD	10.4" color TFT LCD
	PMC system		○	○	○

\*1 : Standard Part program length is different on export condition. On the addition of optional functions, its length can be reduced.  
 ○: Standard OPT : Option (l) : only M type



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